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ABSTRACT

This document reports the findings of a national study of black-white differentials in housing consumption. The main issue is said to be whether blacks pay higher prices and/or consume different residential packages than whites as a result of racial discrimination and segregation. Results indicate that blacks purchase different residential packages and pay different prices for the attributes contained in their respective packages. These differences are considered to result from whites' higher income levels, different housing preferences, and willingness to pay a premium for housing in white neighborhoods. Results of comparisons of blacks living in all black neighborhoods with blacks living in mixed neighborhood indicate that the former purchase smaller quantities of residential services, but pay higher prices. These differences are seen to result from variations in the elasticity of the supply of housing for black occupancy and from variations in the residential packages consumed. Since this analysis focuses on the outcome of the residential market transaction process, how the results obtained can be translated into policy programs is said to be unclear. (Author/AM)

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THE COST OF HOUSING IN BLACK NEIGHBORHOODS

Franklin D. Wilson

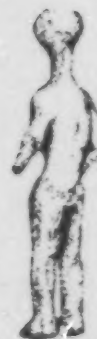
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THE COST OF HOUSING IN BLACK NEIGHBORHOODS

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ABSTRACT

This paper reports the findings of a national study of black-white differentials in housing consumption. The main issue explored is whether blacks pay higher prices and/or consume different residential packages than whites as a result of racial discrimination and segregation. When blacks living in white neighborhoods were compared with whites, it was found that blacks purchased different residential packages and paid different prices for the attributes contained in their respective packages. These differences are shown to have resulted from whites' higher income levels, different housing preferences, and willingness to pay a premium for housing in white neighborhoods. When blacks living in black neighborhoods were compared with blacks living in mixed neighborhoods, it was found that the former purchased smaller quantities of residential services, but paid higher prices. These differences were found to result from variations in the elasticity of the supply of housing for black occupancy and from variations in the residential packages consumed.

THE COST OF HOUSING IN BLACK NEIGHBORHOODS

I. INTRODUCTION

Recent discussions of black-white differentials in the cost of housing consumption in renter markets have generally concluded that blacks pay more for equivalent housing (Kain and Quigley, 1970; King and Mieszkowski, 1973; Gillingham, 1974; von Furstenberg et al., 1974). Interest in this subject is based in large part on an attempt to assess the impact that racial discrimination and segregation have on the social and economic well-being of blacks living in urban areas. It is suggested that racial discrimination and segregation impose economic and noneconomic costs on blacks and other minorities. In housing markets, the economic costs imposed on blacks include higher costs for the residential services consumed, and costs associated with the limited availability of several important components of residential packages (such as new housing and better-quality neighborhoods). A timely volume edited by von Furstenberg, Harrison, and Horowitz (1974) reviews the theoretical significance of the findings of studies that have explored this subject, and suggests possible ways in which future analyses can be improved.

This paper reports the results of a national study of black-white differentials in the cost of housing, which builds on the results of previous studies with the objectives of refining and extending the significance of the issues involved. Three major reasons for a more detailed analysis on this subject can be cited. First, we are aware of only one national study that has focused even indirectly on black-white

differentials in the cost of housing consumption (Gillingham, 1974). The others have been case studies of individual metropolitan areas, the number of which totals roughly five to date (see Duncan and Hauser, 1960; Muth, 1969, 1974; King and Mieszkowski, 1973; Straszheim, 1974; Olsen, 1974; Kain and Quigley, 1970; Quigley, 1974). Second, half of these studies failed to standardize the residential packages of blacks and whites on a sufficient number of housing and neighborhood characteristics to make the comparison of housing cost meaningful.

Finally, only one study made a direct effort to determine the extent to which reasons other than those related to race and to market imperfection cause blacks and whites living in different neighborhoods to pay different prices for the consumption of residential services (Straszheim, 1974). Our results suggest that comparing all white and black households will generally yield misleading results, because race of household head interacts with racial composition of neighborhood to produce substantial differences. When blacks living in white neighborhoods were compared with whites, it was found that blacks purchased different residential packages and paid different prices for the attributes contained in their respective packages. These differences are shown to have resulted from whites' higher income levels, different housing preferences, and willingness to pay a premium for housing in white neighborhoods. When blacks living in black neighborhoods were compared with blacks living in mixed neighborhoods, it was found that the former purchased smaller quantities of residential services, but paid higher prices. These differences were found to result from variations in the elasticity of the supply of housing for black occupancy and from variations in the residential packages consumed.

II. THEORETICAL BACKGROUND

Equilibrium and disequilibrium models have been developed to explain how residential segregation can produce black-white differentials in the cost of identical residential packages. These models are developed and evaluated in detail in the volume edited by von Furstenberg, Harrison, and Horowitz (1974). We summarize here the portion of each of these models that is related to black-white differentials in the cost of rental housing.

Equilibrium Model

The equilibrium model, as elaborated by Muth (1974), starts with the assumption that observed patterns of residential segregation arise from the neighborhood preferences of blacks and whites. Whites, it is assumed, have a strong aversion to living among blacks, so that they are willing to pay a premium to locate in all-white neighborhoods. Blacks, on the other hand, prefer integration, which means that both their preference for living among whites and their aversion to living among blacks are less strong than those of whites. Assuming that the residential distribution of blacks and whites is stable, the rank distribution of prices for equivalent residential packages takes the form $W_I > W_B = N_B > N_I$, where W_I and W_B refer to white households in the interior and at the boundary of black-white residential neighborhoods respectively, and N_B and N_I refer to black households at the black-white boundary and in the interior of black neighborhoods respectively. In other words, the cost of equivalent housing is highest in the interior of white neighborhoods, lowest in the interior of black neighborhoods, and intermediate at the black-white boundary.

If black residential areas are expanding relative to those of whites as a result of population growth, the rank distribution of prices for equivalent residential packages takes the form $W_I > N_B > W_B > N_I$, where the prices paid by black and white households at the boundary are no longer equivalent. Since whites have an aversion to living among blacks, they will not ordinarily be willing to outbid blacks for housing located at the boundary of their respective neighborhoods. In summary, the equilibrium model predicts that whites will pay higher prices for housing when neither black nor white residential areas are expanding relative to each other, while blacks will pay higher prices, at least at the black-white boundary, when their areas are expanding relative to white areas.

Results of studies reported by Haugen and Heins (1969) and King and Mieszkowski (1973) support various aspects of the equilibrium model. Haugen and Heins (1969, p. 660), for example, found that rent differentials between white and nonwhite areas of a city can be attributed to (1) the rate of growth of the nonwhite population; (2) the rate at which whites evacuate the central city; and (3) the degree to which nonwhite areas are concentrated.

The results of King and Mieszkowski's (1973) study of black-white differentials in the cost of rental housing in the New Haven housing market are partially consistent with the equilibrium model but call into question one of its basic assumptions. These authors observed that, relative to whites living in the interior of white residential areas, (1) whites living at the black-white boundary paid less for residential packages; (2) blacks living at the black-white boundary paid about the

same; and (3) blacks and whites living in the interior of black residential areas paid more. The fact that blacks living in the interior of black areas paid the highest prices for residential services is not consistent with the equilibrium assumption that the only factor producing residential segregation, and thus black-white rent differentials, is voluntary self-selection. Indeed, this result is consistent with models that predict either that blacks have a strong taste for segregation or that the residential movement of blacks is being funneled into specific sub-areas of local housing markets as a result of housing discrimination. Recent reviews of studies that have focused on blacks' attitudes toward living in racially mixed neighborhoods and on the existence of discrimination against blacks in housing markets suggest that the latter is the primary operating mechanism (Foley, 1973; Pettigrew, 1973). This brings us to the disequilibrium-model explanation of black-white rent differentials.

Disequilibrium Model

The disequilibrium model asserts that blacks incur higher prices for equivalent residential packages because housing discrimination has limited their residential choices to the central areas of cities where the available housing supply consists of units that have been converted from other uses and units previously occupied by whites. Thus residential segregation based upon formal discriminatory practices has had the effect of making the supply of housing available for black occupancy inelastic with respect to black demand, with the result that blacks pay higher prices for equivalent residential packages. Studies by Duncan and Hauser (1960), King and Mieszkowski (1973), Quigley (1974), and Straszheim (1974) report results that are consistent with the disequilibrium model.

The inelasticity of the supply of housing for black occupancy can raise the cost of housing to blacks in several ways. First, since it is much more expensive for builders to erect new housing on central-city land, because of costs associated with clearing the land and neighborhood externalities, new and better-quality housing is usually constructed at the periphery of metropolitan areas adjacent to existing white residential areas. Moreover, if blacks are excluded from these areas, the net result, assuming low conversion rates and no proportionate increase in changes in occupancy patterns from white to black, is that the demand for housing in existing black neighborhoods is pushed to artificially high levels. Blacks, for example, who wish to rent housing at the black-white boundary, will be required by landlords to pay a percentage mark-up on prices usually charged to whites, to compensate for a perceived long-run decline in income to owners once whites refuse to rent or to remain in the area. The price of renting a dwelling in the interior of black areas, on the other hand, will rise as a result of the failure of the supply of housing to keep up with demand.

Another way in which the inelasticity of the supply of housing in black neighborhoods can affect the prices paid by blacks is through restrictions on the range of alternative residential packages available to blacks (Quigley, 1974). If the demand for better-quality housing, neighborhood environment, and locational amenities rises among blacks as a result of increased income during times in which such components of residential packages are in limited supply in black areas, the prices of available packages will rise accordingly. Thus as Quigley (1974) notes, not only may blacks have to pay higher prices than whites for residential packages

of equivalent quality, but certain kinds of desired residential goods may simply not be available in black neighborhoods at any price.

III. CURRENT STUDY

This paper reports the results of a national study on variations in the cost of rental housing to black and white households. A direct comparison between the equilibrium and disequilibrium models of black-white rent differentials is not attempted here. Such a comparison would require data that would include the prices of rental units under conditions of residential stability and expansion, both within and at the boundary of black and white residential areas. Needless to say, our data do not permit these kinds of distinctions. Moreover, our purpose here is to attempt an extension and refinement of some of the issues raised in the previous section.

One way in which one can study the effects that restrictions on the supply of housing for black occupancy can have on the kinds of residential packages purchased by blacks and the prices they pay for the attributes contained in their packages is to look for differences in the housing situations of blacks living in neighborhoods with different racial compositions. Studies that have focused on "boundary effects" (King and Mieszkowski, 1973) and on the overall differences between blacks and whites (Quigley, 1974; Gillingham, 1974) imply that such differences exist. Straszheim's (1974) analysis of black-white differentials in the cost of housing within sub-areas of the San Francisco-area housing market indicates that these differences do exist, although he does not attempt to construct standardized comparisons to evaluate their magnitudes.

If supply restrictions play an important role in determining the prices blacks pay for their residential packages, then blacks living in segregated neighborhoods should pay higher prices for equivalent residential packages than blacks living in predominantly white or in mixed neighborhoods. It was noted earlier that the extent to which the supply of housing in centrally located black neighborhoods is elastic with respect to demand can affect the price of housing in two ways. First, segregation, based on either racial discrimination or residential preferences, implies that the various sections of urban housing markets are reserved exclusively for particular groups of households. If the supply of housing in black neighborhoods does not increase in proportion to demand, the prices black households have to pay for equivalent residential packages will increase accordingly. On the other hand, if the demand for particular kinds of residential packages increases, but these kinds of packages are in limited supply in black neighborhoods, the prices of available packages with the desired combination of attributes will also increase.

Moreover, since the supply of housing in black neighborhoods is obtained primarily through conversion of existing units either from previous uses or from white occupancy, households in black neighborhoods do not have access to the same kinds of residential packages as do households in other neighborhoods. Thus, the annual cost of housing to blacks living in black neighborhoods may differ from that of whites and of other blacks not only because these households pay different prices for equivalent residential packages, but also because they purchase different kinds of residential packages. Although black neighborhoods may not provide the same kinds of residential packages that can be found in white or mixed neighborhoods, blacks in black neighborhoods do not necessarily

consume less space and poorer-quality residential packages because of an imbalance between supply and demand produced by the funneling effect of residential segregation during periods in which the black population is growing. Indeed, blacks who live in black neighborhoods might consume different residential packages even if there were no racial discrimination in housing and even if all blacks preferred to live in mixed neighborhoods. This is because blacks who live in white or mixed neighborhoods may have higher incomes and/or different residential preferences (exclusive of racial composition of neighborhoods) than blacks who live in black neighborhoods.

In summary, the major objective of this analysis is twofold. First, we wish to determine whether blacks and whites or blacks living in neighborhoods with different racial compositions pay different prices for equivalent residential packages and/or consume different kinds of residential packages. Second, we wish to determine whether these differences reflect the funneling effects of residential segregation resulting from an imbalance of supply and demand, and/or result from differences in income levels and residential preferences.

Data and Procedure

The data for this analysis are derived from a 1-percent public use sample tape with neighborhood characteristics, created by the United States Bureau of the Census in conjunction with the 1970 Census of Population and Housing (United States Bureau of the Census, 1972). From this sample (approximately 2 million households), a 60-percent sample of black and a 15-percent sample of white renter primary families residing in urbanized areas in 1970 were randomly selected for inclusion in this analysis.¹

The unique feature of this data set is that it contains detailed information on the characteristics of the area in which persons live, in addition to characteristics of housing and of persons in households. The areas from which the neighborhood characteristics were drawn do not coincide with census tracts, although they generally form contiguous and relatively compact clusters of households (United States Bureau of Census, 1972).

One approach that can be used to analyze variations in the price of housing paid by different households is to compare the implicit prices of the bundle of characteristics contained in rental units.² It is useful to define a dwelling unit as a bundle of characteristics, in which the annual housing expenditure of a household represents the sum of the prices of the characteristics the dwelling contains. Within any housing market, the prices associated with the characteristics of a dwelling should be the same to all buyers, subject to imperfections produced by fluctuating economic conditions (see Rosen, 1974). If different households or identical households in different neighborhoods pay different prices for identical residential services (as embodied in the characteristics), this implies that the housing market behaves differently toward these units.

The basic procedure followed in this analysis is the construction of hedonic regressions of the form

$$E_h = f (M + HS + N + D + R) \quad (1)$$

The dependent variable, E_h , is annual housing expenditures for black and white primary households. M is a vector of characteristics that defines a minimum residential consumption bundle consisting of a dwelling unit with the following characteristics: located in the central city of an urbanized area in the West South Central region of the United States, less

than four rooms, no basement, built in 1939 or earlier, one-half bath or less, either no heating system or a central warm air furnace, in a neighborhood that is at least 75 percent black, not connected to a public sewer, source of water other than from public or private company, and the cost of utilities included in rent. H is a vector of housing service variables that describes the unit in terms of its size, quality, technological features (heating and utility systems), and other physical characteristics. N is a vector of variables that defines the socioeconomic level, racial composition, housing, and population density of dwellings in neighborhoods. D is a vector of demand variables for the neighborhood and household with respect to neighborhood vacancy rate, residential mobility, and recency of household occupancy of the dwelling unit. R is a vector of geographic residence characteristics designed to measure geographic variations in the price of residential services.³ If $E_b \neq E_w$, there is a black-white housing cost differential. Our objective is to determine the sources of the differences in annual housing costs between black and white households and between black households living in neighborhoods with different racial compositions.

Consistent with this objective, we propose to decompose the difference in the mean annual housing cost estimates of households by using a procedure analogous to performing direct and indirect standardization (see Kitagawa, 1955; Althausser and Wigler, 1972; Dickinson, 1973). If the housing behavior of white households is used as a standard, the total estimated mean difference between blacks and whites can be separated into the following three main components:

$$\bar{E}_w - \bar{E}_b = \sum_{i=0}^n \sum_{j=1}^k [B_{1jw} \bar{X}_{1jw} - B_{1jb} \bar{X}_{1jb}]$$

$$(1) \sum_{i=1}^n \sum_{j=2}^k [B_{1jb} \bar{X}_{1jw} - B_{1jb} \bar{X}_{1jb}] +$$

$$(2) \sum_{i=0}^n \sum_{j=1}^k [B_{1jw} \bar{X}_{1jb} - B_{1jb} \bar{X}_{1jb}] +$$

$$(3) \sum_{i=1}^n \sum_{j=2}^k [B_{1jw} \bar{X}_{1jw} - B_{1jb} \bar{X}_{1jw} - B_{1jw} \bar{X}_{1jb} + B_{1jb} \bar{X}_{1jb}]$$

where subscripts b and w denote black and white households respectively; the summation is over the i^{th} attribute and the j^{th} component of a residential consumption package as defined in equation (1); the B s are the hedonic prices estimated from equation (1); the $\bar{X}$ s are the mean attributes of a residential package; component (1) represents the portion of the total expenditure difference that results from blacks and whites consuming different residential packages; component (2) defines the portion of the total expenditure difference that results from blacks and whites paying different prices for the attributes contained in a standardized residential package; and component (3) reflects black-white differences in annual expenditures resulting from the combined effects of the attributes contained in a standardized residential package and the price paid for these attributes. Component (3) is typically referred to as differences due to "interaction," and as such is the most difficult of the components to interpret because it is not unique to the behavior of either group.

One problem frequently encountered in the use of a component difference framework is that of determining what form of expression of the

differences between two groups will allow the least ambiguous interpretation of the results. In this analysis, differences in the housing behavior of blacks and whites are expressed in percentages, obtained by dividing the difference between expected and observed housing costs to blacks by the observed housing costs to blacks. Table 1 illustrates the computational procedure. The percentages in the body of the table sum to the percentages for the row and column marginals, and the marginal percentages sum to the total percentage difference between black and white households.

In the component difference analysis, the housing behavior of whites is used as a standard. If blacks and whites purchase identical residential packages, substituting the mean characteristics of whites' residential package for those of blacks' package should yield a difference of zero as a component difference in mean requires. Similarly, if blacks and whites pay similar prices for identical residential packages, substituting the prices paid by whites for those paid by blacks should yield a difference of zero as a component difference in prices requires. Thus the percentages reported in Table 1 indicated the expected increase or decrease in the annual housing cost of blacks assuming they purchase the same residential package and/or pay the same prices as whites.

IV. RESULTS

Black-White Differentials

Table A-1 in the Appendix reports the determinants of annual rental expenditures for black and white primary households.⁴ The hedonic

Table 1. Illustration of the Computational Procedure Used to Express the Component Differences between Two Groups in Percent

Cost Factors	Differences			
	Component Differences (in Percent)			Total (in Percent)
	Means	Prices	Interaction	
Minimum consumption package				
Housing services				
Neighborhood characteristics		$[\hat{\bar{E}}_{jb} - \bar{E}_{jb}/\bar{E}_b]100$		$[\hat{\bar{E}}_{jb} - \bar{E}_{jb}/\bar{E}_b]100$
Residential stability				
Geographic variation in prices				
TOTAL	$[(1)/\bar{E}_b]100$	$[(2)/\bar{E}_b]100$	$[(3)/\bar{E}_b]100$	$[\bar{E}_w - \bar{E}_b/\bar{E}_b]100$

regressions and mean characteristic vectors reported in this table were used to construct the component difference analysis reported in Table 2. The discussion will focus on the results reported in Table 2.

The total percentage difference between blacks and whites indicates that blacks would have to increase their annual cash outlays for housing by 31 percent in order to purchase the same residential consumption package as whites. Approximately 87 percent of the difference between blacks and whites in annual housing cost results from these households purchasing different residential packages. The percentages reported in the column headed Component Differences in Means are particularly revealing in this respect. It is clearly evident that the major residential consumption item that differentiates black and white households is neighborhood quality. The higher cash outlays of whites go primarily to purchase higher-quality neighborhoods.

It is important to note that this difference in mean level of neighborhood quality does not necessarily imply that blacks are constrained by a supply inelasticity. If this interpretation were reasonable, then it would be reflected in the prices blacks pay for quality neighborhoods. This is because if blacks' demand for quality neighborhoods cannot be met by the existing housing inventory in black residential areas, the prices for existing quality neighborhoods will be higher. A supply restriction interpretation can be applied to the negative values reported for dwelling-unit quality and residential stability under the Component Differences in Price column. If blacks paid the same prices as whites for dwelling-unit quality, they would pay 7 percent less than what they currently pay. These higher prices may explain why blacks consume 4 percent less in dwelling quality. The fact that they are only

Table 2. Differentials between Blacks and Whites in the Cost of Housing by Major Sources

Cost Factors ¹	Cost to Whites (in Dollars)	Cost to Blacks (in Dollars)	Differences			
			Component Differences (in Percent)		Total (in Dollars)	Total (in Percent)
			Means	Prices Interaction		
Minimum consumption package ²	\$488	\$381		8.2	\$107	8.2
Housing services						
Space	469	287	1.7	9.8	182	14.0
Quality	239	252	3.7	-7.0	-13	-1.0
Neighborhood						
Quality	670	419	24.4	-.8	251	19.4
Density	80	135	-4.0	-1.5	-56	-4.3
Racial composition	-55	-25	-1.0	-.1	-30	-2.3
Residential stability	-246	171	1.1	-7.4	-76	-5.9
Geographic variation in prices	51	20	.3	1.5	31	2.4
Total	\$1695	\$1298	26.4	2.7	\$397	30.5

¹See Table A-1 in the Appendix for a description of the components of the major cost factors.²This factor represents the intercept value obtained by applying equation (1).

able to increase their level of consumption of this component by paying higher prices can have the effect of actually depressing blacks' tastes for higher-quality residential packages.

The price percentage for neighborhood stability is particularly interesting, since it suggests not only that stable black neighborhoods are in short supply, but that blacks pay a premium for purchasing housing in these areas. The percentages of households that have remained in the same dwelling for five years or longer are practically identical for the blacks and whites in our sample (see Table A-1), but blacks pay a higher per-unit price for residential stability. Similarly, although black households moved into their dwellings an average of a year earlier than whites, the per-unit price of length of occupancy is twice as high for blacks. It will be argued below that this price difference for residential stability results from a greater demand for housing by blacks in particular kinds of neighborhoods, and that either blacks have a strong taste for segregation or their demand for housing is being funneled into particular sections of metropolitan-area housing markets.

Finally, it can be observed that if blacks paid the same prices as whites, the prices blacks would pay for a minimum residential consumption package and for housing space would be 8 and 10 percent higher than what they currently pay. We are suspicious of the price difference for dwelling-unit space, since it may also reflect the price of some component of dwelling quality not measured in this analysis. This suspicion is partially based on the fact that most of this price difference is reflected in the number of bathrooms contained in the dwelling, an attribute that is highly correlated with dwelling quality.

One important reservation that can be made about the results reported thus far is that an overall comparison between blacks and whites may be too gross for the purpose of making important distinctions between the two groups. One could ask, for example, whether the same degree of difference would be observed if whites were compared with blacks living in predominantly white neighborhoods. It can be suggested that blacks who live in white neighborhoods ought to exhibit residential consumption patterns similar to those of whites. These comparisons are reported in Table 3. The hedonic regressions and mean characteristic vectors for blacks who live in neighborhoods of less than 25 percent black are reported in Table A-2 in the Appendix, and the mean characteristics values for whites are the same as those reported in Table A-1. The hedonic regressions for the white sample are not reported since they are practically identical to those reported in Table A-1, except for the fact that the intercept value is less because of the omission of the neighborhood racial composition dummies from the regressions.

Table 3 indicates that the basic difference between whites and blacks living in white neighborhoods is the fact that they consume different residential packages, as evidenced by the percentages reported in the Component Differences in Means column. It should be noted, however, that the difference in the neighborhood-quality component of residential packages is not as great as that observed between whites and blacks in general. This implies that blacks can only improve the neighborhood-quality component of their residential packages by obtaining housing in white neighborhoods. In a later section of this paper, an attempt will be made to determine whether these black-white differences

Table 3. Differentials between Blacks Living in White Neighborhoods and Whites in the Cost of Housing by Major Sources

Cost Factors ¹	Cost to Whites (in Dollars)	Cost to Blacks, Neighborhood < 25% Black (in Dollars)	Differences			
			Component Differences (in Percent)			Total (in Percent)
			Means	Prices	Interaction	
Minimum consumption package ²	\$432	\$388		3.3		3.2
Housing services						
Space	469	371	3.9	3.9	-.74	7.1
Quality	238	435	4.5	-15.74	-3.0	-14.2
Neighborhood						
Quality	672	405	12.9	6.0	.37	19.2
Density	79	82	-2.0	2.0	-.21	-21
Residential stability	-246	-294	.63	2.9	-.10	3.5
Geographic variations in prices	53	1	1.1	2.9	-.18	3.7
Total	\$1697	\$1388	21.0	5.0	-2.8	22.2

¹See Tables A-1 and A-2 in the Appendix for a description of the components of the major cost factors.

²This factor represents the intercept value obtained by applying equation (1).

in housing consumption patterns reflect differences in the purchasing abilities of black and white households as measured by income.

The percentages reported in the Component Differences in Price column suggest other important differences. First, if blacks who live in white neighborhoods paid the same prices as whites, they would pay roughly 16 percent less than what they currently pay for housing quality. On the other hand, it is clearly evident that if blacks paid the same prices as whites, they would pay substantially more than they currently pay for the other components of their residential packages. The 3 percent value reported for residential stability, although small, is particularly noteworthy. The fact that blacks living in white neighborhoods would pay prices 3 percent higher than what they currently pay for residential stability is the exact opposite of the situation reported in the comparison between whites and the overall black sample. Here we find that whites pay a higher per-unit price for neighborhoods in which the average inhabitant has lived for at least five years. Since we have controlled for all other components of residential packages, it appears that the most appropriate interpretation of this difference is that it reflects the willingness of white households to pay a premium for residential packages located in all-white neighborhoods. This explanation can also be used to explain why whites pay higher prices for a minimum residential consumption package, since the premiums paid for the latter and for residential stability both imply that whites' demand for housing in white neighborhoods is higher than their demand for housing in mixed neighborhoods. A further elaboration of these results will be made in a later section of this paper, after the housing behavior of blacks living

in white neighborhoods is compared with that of blacks living in black neighborhoods.

Black-Black Differentials

The price estimates reported for the neighborhood racial composition dummies (see Table A-1) suggest that black households in predominantly black neighborhoods (75 percent or more black) pay significantly more for housing than blacks who live in neighborhoods in which the percentage black is lower. Similar differences can be observed for whites, although they are not statistically significant at the .05 level of rejection.⁵ The fact that blacks who live in black neighborhoods pay more for housing suggests that another set of comparisons can be made between blacks living in neighborhoods with different racial compositions.⁶ These comparisons are made below and should be viewed as extensions of the analysis reported in the previous section.

The procedure used to compare differences in the cost of housing for blacks living in neighborhoods with different racial compositions is identical to that used to compare costs for blacks and whites, except that here blacks who live in neighborhoods of less than 75 percent black are used as the standards of comparison. The regressions and means characteristics vectors for black households by racial composition of neighborhoods are reported in Tables A-2 and A-3 in the Appendix. Our comments will be directed toward the percentages reported in Tables 4 and 5. In order to facilitate the comparisons, only the total cost differences are reported in Table 4, and the component differences for the interaction component are omitted from Table 5.

Table 4. Total Component Differences in the Cost of Housing to Blacks by Racial Composition of Neighborhood

Neighborhood Racial Composition	Component Differences (in Percent)			Total (in Dollars)	Total (in Percent)
	Means	Prices	Interaction		
Less than 25% black	19.72	-1.75	-9.3	\$111	8.7
25-49% black	7.86	-7.54	1.62	24.75	1.94
50-74% black	6.18	-4.54	-2.7	-13.28	-1.04

Table 4 reports the component differences analyses comparing blacks who live in neighborhoods of 75 percent or more black with blacks who live in neighborhoods of less than 25, 25-49, and 50-74 percent black. It can be observed that the major factor that differentiates blacks who live in black neighborhoods from those who do not is the purchase of different residential packages (for example, component differences in means). If blacks in black neighborhoods purchased the same residential package as blacks who live in neighborhoods of less than 25, 25-49, and 50-74 percent black, they would pay, respectively, 20, 8, and 6 percent more annually for housing. The component differences in means reported in Table 5 suggest that blacks who live in neighborhoods of less than 75 percent black purchase higher-quality residential packages. Thus the lower the percentage of blacks in neighborhoods, the higher the quality of the residential packages consumed. An attempt will be made later in this paper to determine whether this variation in level of consumption by percent black in neighborhoods results from differences in income levels, in tastes, or in the supply of high-quality residential packages.

Although the percentage differences in prices for residential packages exhibited in Table 4 do not vary as uniformly as the mean differences, the largest percentage difference in prices is between blacks in black neighborhoods and blacks in neighborhoods of less than 25 percent black. This pattern could have resulted from the operation of the so-called neighborhood tipping process, in which as the percentage of blacks in previously all-white neighborhoods exceeds a certain level, whites refuse to rent in the area and whites who live in the area move out. The net result is a lowering of the prices charged to blacks,

because of an increase in the amount of housing available for black occupancy.

It was suggested earlier that one way to determine whether residential segregation affects the prices paid by blacks for housing would be to compare the prices paid by blacks living in white and mixed neighborhoods with those paid by blacks living in black neighborhoods. Comparing the total prices paid by blacks in neighborhoods with different racial compositions can conceal a great deal of variation in the prices each sub-group of black households pays for specific components of residential packages. Thus, the most meaningful comparisons for assessing the effects of segregation are those between the prices blacks in different types of neighborhoods pay for similar components of their residential packages. The comparisons of major interest are those involving differences in the prices of a minimum consumption bundle and residential stability, and those involving differences in the prices of housing quality and neighborhood quality. If blacks in black neighborhoods pay higher prices for residential stability and a minimum consumption package, we interpret these differences as resulting from a greater demand for housing in black neighborhoods. On the other hand, if blacks in black neighborhoods pay higher prices for residential quality, this is interpreted as the effect of an inelasticity in the supply of this component of residential packages in black neighborhoods.

The results reported in Table 5 indicate a great deal of variation in the prices of the major components of residential packages. In the first set of comparisons we wish to make, the negative percentages reported for a minimum consumption package and residential stability indicate clearly that blacks who live in black neighborhoods pay higher

Table 5. Component Differences in the Cost of Housing to Blacks by Racial Composition of Neighborhood and Major Cost Factors: in Percent

Cost Factors ¹	Racial Composition of Neighborhood					
	< 25% Black		25-49% Black		50-74% Black	
	Means	Prices	Means	Prices	Means	Prices
Minimum consumption package ²		-6.1		-10.22		-3.88
Housing services						
Space	-9.0	12.50	-.43	6.08	3.62	9.05
Quality	7.0	18.83	-.38	-6.01	.03	-8.08
Neighborhood						
Quality	13.06	-6.20	7.45	9.77	2.14	2.39
Density	-.90	-4.28	.19	.74	-.17	-.20
Residential stability	.80	-18.95	.67	-16.93	.45	-7.85
Geographic variation in prices	.70	2.42	.37	9.03	.12	4.04

¹See Tables A-2 and A-3 in the Appendix for a description of the components of the major cost factors.

²This factor represents the intercept value obtained by applying equation (1).

prices as a result of a greater aggregate demand for housing. Thus if they paid the same prices as blacks who live in white neighborhoods, blacks who live in black neighborhoods would pay 6 percent less than what they currently pay for a minimum consumption package and 19 percent less than what they currently pay for residential stability.

The price estimates for residential quality are mixed. For housing quality, blacks in black neighborhoods would pay prices 19 percent higher if they paid the same prices as blacks living in white neighborhoods, 6 percent lower if they paid the same prices as blacks living in neighborhoods of 25-49 percent black, and 8 percent lower if they paid the same prices as blacks living in neighborhoods of 50-74 percent black. On the other hand, the prices they would pay for neighborhood quality would be less in white neighborhoods, and more in mixed neighborhoods. One possible explanation for these inconsistencies is that limitation of the supply of housing relative to black demand is not the only factor operating. That this is a distinct possibility is implied by the pattern of differences and similarities between the percentages for means and those for prices.

Blacks who live in white neighborhoods purchase better-quality housing, but at a price 19 percent higher than what blacks in black neighborhoods pay. If there is a supply limitation, it is in white, not black, neighborhoods. This pattern is distinctly different from that observed between blacks in black neighborhoods and blacks in neighborhoods of 25-74 percent black. The latter group of households purchases bundles of housing quality similar to those of blacks in black neighborhoods, but at lower prices. This set of price differences clearly

implies that the availability of high-quality housing in black neighborhoods is limited relative to black demand.

It was observed previously that the purchase of neighborhood quality declines steadily as the percentage of blacks in neighborhoods increases. But note in Table 5 that blacks in white neighborhoods pay 6 percent less for neighborhood quality than blacks in black neighborhoods. This suggests that because the supply of quality neighborhoods is greater, it can be obtained at lower per-unit prices. The fact that blacks in neighborhoods of 25-74 percent black pay higher prices for neighborhood quality than blacks who live in white neighborhoods implies that these households are consuming higher-quality packages at higher per-unit prices because the supply of this good is limited relative to black demand. Thus the only firm conclusion that can be drawn from these patterns is that variations in the price of housing to blacks by racial composition of neighborhood depend not only on the demand for residential quality, but also on the willingness of black households to pay higher prices to purchase this good.

Income and Tastes

Up to this point attention has been directed toward determining in what ways racial discrimination and segregation can affect the prices blacks pay for residential services. It was suggested that if such effects could be observed, they would probably be reflected in the prices blacks pay for a minimum consumption package, residential stability, and residential quality. It was argued that if blacks in white neighborhoods paid higher prices for these commodities than whites or if blacks in black neighborhoods paid higher prices for these

commodities than other blacks, these higher prices resulted from the fact that the available supplies of particular kinds of residential packages were insufficient to meet black demand. Moreover, it was observed that the major difference between whites and blacks living in white neighborhoods, and between blacks in black neighborhoods and other blacks, is the purchase of different residential packages. Whites tend to purchase better-quality and more spacious residential packages than blacks who live in white neighborhoods, while blacks who live in white or mixed neighborhoods tend to purchase better-quality residential packages than blacks who live in black neighborhoods.

In contrast to price differences, differences in the kind of residential package consumed can result from factors other than racial discrimination and segregation. First, the income levels of white and black households may differ, and the income levels of black households may vary by racial composition of neighborhoods. Thus, blacks who live in black neighborhoods may purchase lower-quality residential packages because their income level is lower. Second, it could be that blacks who live in black neighborhoods simply do not have the same level of "tastes" for quality housing as blacks in other neighborhoods, but prefer to spend their income on the purchase of other consumption items. (We think that this is unlikely, but an attempt will be made to control for it.)

Third, it is entirely possible that some blacks may have a stronger preference for living among other blacks than for quality residential packages, so that given a limited supply of the latter, they opt for residential segregation. In other words, in the absence of any restriction on the residential choices of blacks, some blacks may simply trade

off better-quality residential packages for the opportunity of living in black neighborhoods. This is a distinct possibility, although it would be an oversimplification to suggest that differences from this source can be distinguished from differences resulting from the fact that the residential choices of blacks are restricted to those sub-areas of housing markets where high-quality residential packages are in limited supply (see Lapham, 1971). Most researchers prefer to interpret differences in consumption levels as resulting from the effects of discrimination. We, on the other hand, prefer a more neutral position, since we cannot distinguish between the effects of discrimination and those of racial preferences. Clearly blacks' tastes for segregation and racial discrimination can both produce an imbalance in the relationship between the demand for and the supply of housing in black neighborhoods. The fact that roughly 52 percent of the blacks included in this analysis live in neighborhoods of less than 75 percent black rules out the possibility that racial discrimination is the only factor affecting the residential distribution of blacks.⁷

The major objective in this section is to determine the extent to which differences in housing consumption, between blacks and whites and between blacks living in neighborhoods with different racial compositions, result from differences in income, from differences in tastes, or from the funneling effect of segregation, where the latter factor reflects the effects of both racial discrimination and the racial residential preferences of black households.

With the above objective in mind, the median rent and income levels of blacks and whites are compared. The measure of income employed is expected or permanent income. A number of researchers have argued that

current disposable income is not the most appropriate measure to relate to annual housing expenditures, since this measure has a transitory component that reflects unusual or windfall income that can be earned by households in any given year (Reid, 1962; Lee, 1968; de Leeuw, 1971; Kain and Quigley, 1972). Total family income for 1969 is separated into stable and transitory components, and the former component is used in this analysis. The stable component of total family income is defined as the additive effects that are derived by regressing the total income of head and spouse of households separately onto a set of variables that are considered their determinants. Thus, the income variable is estimated by fitting equations of the form

$$\text{Income} = f (W + X + Y + Z). \quad (2)$$

W is a vector of geographic residence characteristics, such as region of the country and size of urbanized area; X is a vector of employment characteristics, including occupation, industry, hours and weeks worked in 1969, year last worked, place of work, and means of transportation to work; Y is a vector of sources of income characteristics, such as wages, salary, non-farm business, farm, social security, and welfare; and Z is a vector of demographic characteristics, including age and years of schooling. Equation 2 was estimated for black and white heads of household and for their spouses, with the two subsequently combined to obtain the measure of total family income. The major advantage that this measure of permanent income has over the use of current disposable income is that the contaminating effects that unusual income can have on housing consumption are eliminated.

Table 6. Total Income and Rent Expenditures for Black and White Primary Households Living in Urbanized Areas, 1970

Household Types	Median Values		Observations
	¹ Income	Rent	
Whites	\$9455	\$1583	8851
Blacks by racial composition of neighborhoods			
Less than 25% black	7400	1286	1166
25-49% black	7457	1249	1018
50-74% black	7468	1197	1175
75% or more black	7455	1245	3146

¹ The measure of income used is expected income.

Tables 6, 7, and 8 report the median rent and expected income levels for black and white renter primary households. It can be observed in Table 6 that the family income level of whites is \$2000 higher than that of blacks, while the differences between the income levels of blacks living in neighborhoods of different racial compositions are practically nil. The fact that whites have higher income levels than blacks probably accounts for a substantial portion of the differences between the kinds of residential packages these households purchase. Whites purchase residential packages that are of better quality and contain more space than those of blacks because of their higher income levels. On the other hand, since the median income level of blacks does not vary by racial composition of neighborhood, we can rule out the possibility that variations in income levels account for the differences in the kinds of residential packages blacks purchase.

Table 7 reports the median annual rent paid by black and white primary households, controlling for level of income. In order to make the comparisons more meaningful, the differences between whites and blacks who live in white neighborhoods are expressed as a percent of the median rent level of black households, and the differences between blacks who live in black neighborhoods and blacks who live in mixed neighborhoods are expressed as a percent of the median rent level of blacks who live in black neighborhoods. These percentage differences are reported in Table 8.

With respect to the differences between whites and blacks who live in white neighborhoods, it can be observed that differences in annual median rent levels decline as income level increases. At lower income levels, whites appear willing to spend more on housing than blacks,

Table 7. Median Rent Expenditures for Black and White Households by Income Levels, 1970

Households	Income Levels							
	< \$5000	\$5000-7499	\$7500-9999	\$10000-12499	\$12500+			
	Rent	N	Rent	N	Rent	N	Rent	N
Whites	\$1272	1586	\$1436	1555	\$1517	1642	\$1667	1549
Blacks by racial composition of neighborhood								
Less than 25% black	960	244	1221	353	1362	293	1463	181
25-49% black	1056	216	1165	298	1293	263	1420	175
50-74% black	1055	237	1151	355	1238	322	1363	182
75% or more black	1050	711	1206	878	1284	829	1376	543
							1478	185
							1780	95
							1643	66
							1433	79

which suggests that differences in both income and tastes may be responsible for black-white differences in consumption levels. If income were the only factor producing differences between black and whites, the percentage differences observed would be constant across income levels. We rule out the funneling effect of segregation as an explanation here, because blacks who live in white neighborhoods are least affected by housing supply limitations, which, as we have seen, mainly affect the prices paid by blacks living in the interior of black neighborhoods.

When blacks who live in black neighborhoods are compared with blacks who live in white and mixed neighborhoods a somewhat different pattern emerges. A distinct triangular pattern of percentage differences can be observed in Table 8. At lower income levels, blacks in black neighborhoods have higher rent levels than other blacks, but as one moves from the lower-left-hand corner to the upper-right-hand corner of Table 8, blacks in black neighborhoods have substantially lower rent levels. Since the income levels of black households do not vary significantly by racial composition of neighborhoods, the funneling effect explanation is clearly a more plausible interpretation of this pattern. At lower income levels, blacks in black neighborhoods probably pay higher rents, because of the limited availability of housing for low-income occupancy; while at higher income levels, blacks in black neighborhoods purchase lower-quality residential packages because high-quality packages are either in limited supply or not available. These results are consistent with what we would expect if blacks in black neighborhoods were affected by housing supply restrictions. If the supply of housing in black neighborhoods does not respond proportionately to black demand for housing either through conversion of existing units or

Table 8. Percentage Differences in Median Rent between Whites and Blacks Living in White Neighborhoods and between Blacks in Black Neighborhoods and Blacks in Neighborhoods of Less than 75% Black, by Level of Income

Type of Comparison ¹	Income Level				
	< \$5000	\$5000-7499	\$7500-9999	\$10000-12499	\$12500+
$(W-B_{<25\%/B_{<25\%}}) 100$	32.4	17.6	11.2	14.0	8.3
$(B_{<25\%} - B_{>75\%/B_{>75\%}}) 100$	-8.6	1.2	6.7	6.3	20.4
$(B_{25-49\%} - B_{>75\%/B_{>75\%}}) 100$	.6	-3.4	.7	3.2	11.2
$(B_{50-74\%} - B_{>75\%/B_{>75\%}}) 100$	.5	-4.6	-3.6	.2	3.0

¹Where W refers to white households; $B_{<25\%}$ refers to blacks in neighborhoods of less than 25 percent black; $B_{25-49\%}$ refers to blacks in neighborhoods of 25-49 percent black; $B_{50-74\%}$ refers to blacks in neighborhoods of 50-74 percent black; and $B_{>75\%}$ refers to blacks in neighborhoods of 75 percent or more black.

through changes in occupancy from white to black, lower-income blacks are more likely to be adversely affected than higher-income blacks. This is because during times in which the demand for housing in black neighborhoods increases as a result of population growth, higher-income blacks can outbid lower-income blacks for the vacant housing that does exist. The fact that blacks who live in mixed neighborhoods have higher median rent levels at higher income levels than blacks who live in black neighborhoods is consistent with the finding, reported earlier, that indicated that high-quality housing was in limited supply in black neighborhoods. In other words, blacks who live in black neighborhoods purchase poor-quality residential packages because higher-quality residential packages are in limited supply.

V. DISCUSSION

Summary of Findings

The major objective of this analysis has been twofold: (1) to determine whether the total annual housing cost differences between blacks and whites, and between blacks with respect to racial composition of neighborhoods, reflect differences in the kinds of residential packages consumed by these households and/or differences in the prices they pay for equivalent residential packages; and (2) to determine whether these differences are the consequences of differences in income levels or in tastes for housing, and/or result from the funneling effect of residential segregation. The results obtained from the empirical analysis indicate that the extent and causes of the differences vary

rent levels than blacks in white and mixed neighborhoods, while at higher income levels these households have substantially lower rent levels. The relevant question to be raised here is why some blacks with high income levels prefer to live in black neighborhoods where the range of alternative residential packages is limited and the prices are higher. It is questionable whether racial discrimination in housing alone produces these differences.

If there are economic costs associated with blacks' living in segregated neighborhoods, it is likely that low-income households are affected more by such costs. When the supply of housing in black neighborhoods is limited relative to black demand, lower-income households are placed at a disadvantage since they cannot outbid high-income households for whatever housing that is available. The economic costs borne by middle- and upper-income black households are likely to be reflected in the higher prices they pay for quality residential packages, which do not possess the full range of desirable attributes that can be obtained in white or mixed neighborhoods.

Implications

Since this analysis has been focused primarily on the outcome of the residential market transaction process, it is not clear exactly how the results reported here can be translated into policy programs to improve the housing conditions of blacks that can be initiated either by governmental agencies or by private organizations operating in the public sector. One aspect of this issue that has been apparent to most housing analysts for quite some time is the fact that black-white differences in housing consumption are the consequence of inequality of

economic position in society. Thus part of the problem simply relates to the fact that the lower average income level of black households limits the range of alternative residential packages they can purchase and restricts their residential choices to central-city locations. However, improving the economic position of blacks is a necessarily long-term solution to improving the housing condition of blacks who live in the ghetto areas of central cities, and it is questionable whether such improvements can be made without providing blacks with equal access to the educational and employment opportunities available to residents of other sections of metropolitan areas.

The spatial concentration of blacks in central-city areas of low-quality housing is a legacy inherited from the past, based in large part on a host of discriminatory practices that have restricted their residential movements (see Foley, 1973). To the extent that the residential segregation of blacks reflects past and current discriminatory practices, the housing environment of blacks will probably not improve significantly, for two important reasons. First, the segregation of blacks in old central-city areas, based on discrimination, will almost certainly have the effect of forcing them to pay higher prices for residential services during periods in which either population growth increases their demand for housing or increased real income increases their demand for better-quality residential packages. This is because housing discrimination affects both the residential movement of individual blacks and the rate at which housing at the black-white boundary changes from white to black occupancy. If blacks are forced to pay higher prices for housing because of residential discrimination, it is likely that they

will have to either consume smaller qualities of residential services and/or increase their expenditures for housing by reducing their consumption of other goods and services. Thus the purchasing power of blacks' income will be substantially lower than what it would be in the absence of discrimination.

Second, the segregation of blacks in old central-city areas limits their source of supply of housing to conversion from white to black occupancy. In this case, blacks are unable to purchase the same residential packages as whites at any price, since whites improve the quality of their housing stock through new construction. The construction of new housing and the renovation of existing housing will be costly, both to the producer and to the black consumer, unless public funds are used to support such projects (see Ray, 1973, pp. 367-381).

That segregation imposes economic costs on blacks who live in black neighborhoods has been adequately demonstrated in this paper. However, any program designed to eliminate such costs must deal with the issues of what forces operate in local housing markets to produce segregation, and under what conditions segregation can lead to higher prices and affect the type of residential packages consumed by black households. It is suggested that segregation contributes to package-price variations when it becomes a component of the residential market transaction process, as a result of either racial discrimination or the neighborhood racial preferences of black and white households. This writer feels that the housing environment of blacks could be improved significantly if (1) existing anti-discriminatory laws were more stringently enforced and publicized, (2) blacks were encouraged to seek housing in the outer

sections of metropolitan areas, and (3) the economic costs to blacks and to society of maintaining segregation were more widely publicized.

Limitations

Although this writer believes that this analysis is more extensive in scope and coverage than its predecessors, a few reservations about generalizing the findings reported here are appropriate. In an effort to reduce the complexity of the analysis, owner households and renter households other than primary families were excluded. Differentials in the cost of housing to both of these groups are currently being analyzed and will be the subject of future reports. We simply wish to note that male- and female-headed black households are less well-off socioeconomically than primary families, and that their housing situation in all probability differs from that of the latter group. Although it is useful for some purposes to analyze the housing behavior of renters and owners separately, such an approach may seriously distort the degree of difference that exists between blacks and whites. This is particularly true if renters and owners do not consume the same kinds of residential packages, and if blacks and whites are more likely to be of one tenure status than another.

Finally, we note that our attempt to extend the analysis of black-white differentials in housing consumption by focusing on data derived from urbanized areas scattered across the United States affects the generalizability of the findings reported. Perhaps the most serious limitation in this respect lies in the possible aggregation error introduced by pooling data from wide geographic areas that may differ with respect to their price structures and the character of their housing

inventories. Some effort was made to control for the effects that geographic variations in supply and demand can have on the price of residential services by including dummies for regions of the country and for size of urbanized areas. However, it is not known exactly how successful we were in this effort.

APPENDIX

Table A-1. The determinants of annual housing cost for renter primary families living in urbanized areas in 1970: means and regression coefficients by race

Characteristics ¹	Whites		Blacks	
	Means	Coefficients	Means	Coefficients
I. Housing space				
A. Number of rooms ¹				
3 rooms or less ¹	---	---	---	---
4 rooms	.246	\$175.739	.231	\$154.501
5 rooms	.116	288.288	.122	217.154
6 rooms	.030	341.143	.033	304.805
7 rooms	.011	436.093	.012	296.932
8 or more rooms	.005	138.831	.006	612.029
B. Basement				
No basement	---	---	---	---
With basement	.601	57.780	.615	134.803
Concrete slab	.277	-14.076*	.257	44.268
C. Bathrooms				
1/2 bath or no bath	---	---	---	---
1 complete bath	.827	177.571	.888	88.563
1 1/2 bath	.070	460.887	.036	194.965
2 complete baths	.068	830.316	.023	401.938
2 1/2 or more baths	.013	155.520	.005	501.555
D. Number of units in structure	3.288	27.481	3.22	5.055*
II. Housing quantity				
A. Type of heating system				
Central air furnace	---	---	---	---
Steam or hot water	.342	-30.560	.378	-41.697
Built-in electric unit	.067	-3.819*	.049	27.924*
Floor, wall, or pipeless furnace	.101	-53.765	.073	-38.643*
Room heater with flue	.095	118.366	.149	101.590
Room heater without flue	.034	-95.678	.084	-121.439
Fireplace, stove, or portable heater	.018	-173.705	.042	-118.651

Table A-1 continued

Characteristics ¹	Whites		Blacks	
	Means	Coefficients	Means	Coefficients
B. Year built				
1969-1970	.037	\$433.390	.018	\$174.702
1965-1968	.128	444.296	.058	217.976
1960-1964	.127	357.152	.084	160.774
1950-1959	.177	196.795	.163	65.108
1940-1949	.134	100.407	.181	31.034
1939 or earlier	---	---	---	---
C. Utilities				
Pay no utilities	---	---	---	---
Electricity	.833	140.713	.775	171.672
Gas	.629	-27.673	.674	46.661
Water	.213	121.673	.210	96.289
Fuel	.088	68.311	.096	123.374
Water source (public)	.982	-7.356*	.996	96.301*
Sewage	.944	-19.754	.978	-38.169*
III. Neighborhood variables				
A. Neighborhood quantity				
Median income	10.743	52.855	7.457	44.304
Percent units with gross rent of \$150 or more	31.927	7.607*	12.145	10.082
Percent units built after 1960	24.46	-5.733	13.381	-2.524
B. Neighborhood density				
Percent of one or more persons per room	6.508	2.598*	14.405	4.910
Percent unit in five unit structures or more	28.160	2.228	35.028	1.843*
C. Racial composition of neighborhood				
25% or less black	.922	-54.527*	.179	-35.959
25-49% black	.052	-88.519*	.157	-70.661
50-74% black	.019	-22.028*	.181	-42.882
75% or more black	---	---	---	---

Table A-1 continued

Characteristics ¹	Whites		Blacks	
	Means	Coefficients	Means	Coefficients
IV. Residential stability				
Percent same house 5 years ago	50.069	\$ -3.444	50.557	\$ -2.232
Percent vacant dwellings	3.122	1.118*	4.861	-2.125*
Year household moved into unit	1.697	-46.295	2.139	-22.451
V. Geographic variation in prices				
A. Central city-- suburbs by size of U.A.				
Central city	---	---	---	---
Suburbs				
50,000-499,999	.079	-39.176	.020	-106.01
500,000-999,999	.045	-51.531	.010	-64.52
1,000,000 or more	.295	13.571	.090	-29.125
B. Regions of U.S.				
West South Central	---	---	---	---
New England	.085	109.445	.029	70.013
Middle Atlantic	.277	98.475	.289	48.738
East North Central	.181	36.797*	.217	28.151*
West North Central	.054	24.821	.032	-91.796
South Atlantic	.111	-12.196*	.200	3.552*
East South Central	.031	-82.157	.056	-132.303
Mountain	.032	21.256*	.007	126.064
Pacific	.160	74.900	.078	151.043
Intercept value		488.001		381.327
Total sample size	8,851		6,503	
Annual gross rent	\$1,696		\$1,299	
Multiple R ² corrected	.599		.493	

Source: 1970 1% Public Use Sample of Neighborhood Characteristics.

*Indicates that the regression coefficient is not twice the size of the standard error.

¹ Those attributes for which no values are reported were the omitted categories in the regression analysis.

Table A-2. The determinants of annual housing cost for black rental primary families in 1970: means and regression coefficients by racial composition of neighborhood

Characteristics ¹	Racial Composition of Neighborhood			
	< 25% Black		25-49% Black	
	Means	Coefficients	Means	Coefficients
I. Housing space				
A. Number of rooms ¹				
3 rooms or less ¹	---	---	---	---
4 rooms	.227	\$174.557	.232	\$147.089
5 rooms	.107	231.274	.103	265.119
6 rooms	.031	243.925	.033	152.306
7 rooms	.013	150.845*	.009	186.154*
8 or more rooms	.003	-403.715*	.008	1220.722
B. Basement				
No basement	---	---	---	---
With basement	.557	153.0	.643	100.876
Concrete slab	.303	-5.877	.234	28.117*
C. Bathrooms				
1/2 bath or no bath	---	---	---	---
1 complete bath	.852	153.761	.894	120.560
1 1/2 bath	.050	245.059	.035	326.889
2 complete baths	.027	792.111	.018	514.429
2 1/2 or more baths	.008	1916.343	.007	-81.869*
D. Number of units in structure	3.378	10.581*	3.384	3.702*
II. Housing quantity				
A. Type of heating system				
Central air furnace	---	---	---	---
Steam or hot water	.319	57.442	.419	87.319
Built-in electric unit	.068	91.039*	.042	-11.190*
Floor, wall, or pipeless furnace	.071	-173.548	.065	11.361*
Room heater with flue	.158	-146.914	.135	-75.235*
Room heater without flue	.088	-160.288	.079	-23.334
Fireplace, stove, or portable heater	.046	-209.393	.038	-120.481

Table A-2 continued

Characteristics ¹	Racial Composition of Neighborhood			
	< 25% Black		25-49% Black	
	Means	Coefficients	Means	Coefficients
B. Year built				
1969-1970	.025	\$ 73.160*	.021	\$ 74.957*
1965-1968	.096	277.279	.055	236.095
1960-1964	.121	236.148	.082	214.084
1950-1959	.178	125.697	.192	51.548*
1940-1949	.169	85.113*	.178	-13.678*
1939 or earlier	---	---	---	---
C. Utilities				
Pay no utilities	---	---	---	---
Electricity	.759	206.592	.740	122.979
Gas	.584	7.413*	.651	45.233*
Water	.214	136.443	.222	34.893*
Fuel	.107	154.191	.089	141.639
Water source (public)	.991	132.200*	.994	-76.671*
Sewage	.967	76.584	.986	37.621*
III. Neighborhood variables				
A. Neighborhood quality				
Median income	8.669	32.985	8.015	67.161
Percent units built after 1960	20.069	-2.832	14.779	-3.752
Percent units with gross rent of \$150 or more	18.804	9.360	14.250	7.051
B. Neighborhood density				
Percent one or more person per room	12.005	3.436*	12.449	7.184
Percent units in five unit structure or more	35.231	1.167*	39.840	1.306
IV. Residential stability				
Percent same house 5 years ago	50.023	-4.465	48.499	-4.255
Percent vacant dwellings	3.913	-5.250*	4.416	-1.672*
Year household moved into unit	1.877	-26.472	1.987	-28.227

Table A-2 continued

Characteristics ¹	Racial Composition of Neighborhood			
	< 25% Black		25-49% Black	
	Means	Coefficients	Means	Coefficients
V. Geographic variation in prices				
A. Central city--suburbs	.255	\$-133.416	.171	\$ -25.601*
B. Regions of U.S.				
West South Central	---	---	---	---
New England	.053	11.795*	.051	207.277
Middle Atlantic	.298	104.370	.408	222.163
East North Central	.166	36.626*	.146	89.080*
West North Central	.033	-124.402*	.035	56.340*
South Atlantic	.206	-20.112*	.142	71.368*
East South Central	.063	-213.199	.037	-129.684*
Mountain	.015	225.466*	.009	-21.764*
Pacific	.082	190.722	.073	251.039
Intercept value		\$379.928*		\$335.068*
Total sample size	1166		1070	
Annual gross rent	\$1358		\$1302	
Multiple R ² corrected	.536		.499	

Source: 1970 1% Public Use Sample of Neighborhood Characteristics.

*Indicates that the regression coefficient is not twice the size of the standard error.

¹ Those attributes for which no values are reported were the omitted categories in the regression analysis.

Table A-3. The determinants of annual housing cost for black renter primary families in 1970: means and regression coefficients by racial composition of neighborhood

Characteristics ¹	Racial Composition of Neighborhood			
	50-74% Black		75% or More Black	
	Means	Coefficients	Means	Coefficients
I. Housing space				
A. Number of rooms				
3 rooms or less	---	---	---	---
4 rooms	.246	\$166.826	.226	\$133.648
5 rooms	.119	193.323	.135	215.747
6 rooms	.025	491.053	.032	341.502
7 rooms	.007	720.720	.015	308.029
8 or more rooms	.005	424.394	.006	527.358
B. Basement				
No basement	---	---	---	---
With basement	.607	186.127	.631	100.879
Concrete slab	.254	118.166	.248	32.214*
C. Bathrooms				
1/2 bath or no bath	---	---	---	---
1 complete bath	.890	95.300	.899	60.776
1 1/2 bath	.035	155.647	.032	146.619
2 complete baths	.023	492.448	.023	171.455
2 1/2 or more baths	.005	-396.133	.005	370.416
D. Number of units in structure	3.226	-1.535*	3.112	1.412*
II. Housing quantity				
A. Year built				
1969-1970	.013	226.798	.016	240.150
1965-1968	.053	138.717	.047	184.252
1960-1964	.056	80.364*	.070	115.867
1950-1959	.162	34.631*	.149	43.762
1940-1949	.183	4.431*	.186	\$19.305*
1939 or earlier	---	---	---	---
B. Utilities				
Pay no utilities	---	---	---	---
Electricity	.769	186.236	.795	145.433
Gas	.659	53.218*	.711	82.722
Water	.240	85.703	.193	101.244
Fuel	.101	122.476	.094	116.960
Water source (public)	.995	-74.034*	.998	77.546
Sewage	.970	-51.912*	.982	-104.114

Table A-3 continued

Characteristics ¹	Racial Composition of Neighborhood			
	50-74% Black		75% or more Black	
	Means	Coefficients	Means	Coefficients
C. Type of heating system				
Central air furnace	---	---	---	---
Steam or hot water	.386	\$-36.045	.384	\$-27.526*
Built-in electric unit	.042	118.701	.047	-26.855*
Floor, wall, or pipeless furnace	.075	-38.492*	.075	-.6706*
Room heater with flue	.159	-91.394	.148	-98.692
Room heater without flue	.093	-83.251*	.080	-153.061
Fireplace, stove, or portable heater	.045	-49.284*	.041	-88.262
III. Neighborhood variables				
A. Neighborhood quality				
Median income	7.252	46.229	6.893	38.908
Percent units built after 1960	12.736	-1.849	10.656	-1.824
Percent units with gross rent of \$150 or more	10.844	10.202	9.445	12.281
B. Neighborhood density				
Percent one or more persons per room	14.662	5.191	15.862	4.001
Percent units in five structures or more	34.510	1.888	33.486	2.527
IV. Residential stability				
Percent same house 5 years ago	48.073	-2.464	52.347	-.705*
Percent vacant dwellings	5.127	.4563*	5.267	-.830*
Year household moved into unit	2.136	-23.455	2.289	-16.886
V. Geographic variation in prices				
A. Central city--suburbs				
	.126	\$12.791*	.050	\$27.474*

Table A-3 continued

Characteristics ¹	Racial Composition of Neighborhood			
	50-74% Black		75% or More Black	
	Means	Coefficients	Means	Coefficients
B. Regions of U.S.				
West South Central	---	---	---	---
New England	.077	\$160.134	.014	\$88.769*
Middle Atlantic	.329	90.513*	.232	-29.044*
East North Central	.174	30.294*	.275	3.308*
West North Central	.022	-90.191*	.034	-97.964
South Atlantic	.187	18.431*	.221	-10.323*
East South Central	.063	-84.116*	.057	-129.432*
Mountain	.005	-68.403*	.005	145.312*
Pacific	.082	198.501	.076	93.479
Intercept value		\$415.984		\$465.554
Total sample size	1123		3146	
Annual gross rent		\$1264		\$1277
Multiple R ² corrected	.544		.499	

Source: 1970 1% Public Use Sample of Neighborhood Characteristics.

*Indicates that the regression coefficient is not twice the size of the standard error.

¹Those attributes for which no values are reported were the omitted categories in the regression analysis.

NOTES

1. The Bureau of the Census defines a primary family as a household in which both spouses are present.
2. This approach was pioneered by Lancaster. It is applied to price variations in housing and is discussed extensively in Vapham (1971), Gillingham (1974), and Rosen (1974).
3. This is a reduced-form equation of the market solution of the combined effects of supply and demand factors.
4. The regression coefficients reported there are the OLS estimates. Following the usual procedure for this type of analysis, four equations were estimated: OLS; semi-log equations with first the dependent variable and second the independent variable; and an equation with all variables in log form. Neither of the log equations provided any more significant information than that obtained by the OLS equation.
5. It should be noted that a more theoretically meaningful breakdown of the percent black in neighborhoods would distinguish between whites who live in neighborhoods of less than 25 percent black. We did not follow that procedure here because the average white household lives in a neighborhood of less than 3 percent black. Since our estimating procedure is most effective with large N_s , we decided that the current division was a reasonable compromise for the sake of compatibility.
6. Gillingham (1974) decided against using both race of household head and racial composition of neighborhood in the same regression to estimate the determinants of annual rent, because the two variables

are highly correlated. We think he was in error, since race of household head interacts with racial composition of neighborhood to produce different estimates when regressions are computed separately for black households subdivided by racial composition of neighborhood (see Straszheim, 1974).

7. It may be argued that the distribution of blacks in neighborhoods with different racial compositions may differ with respect to regions of the country, and that these differences may reflect the varying effects of racial discrimination. However, we can find little direct support for this hypothesis in our data. We compared the regional distribution of blacks (using the Bureau of the Census's nine sub-region classification) who live in neighborhoods of 75 percent black or more with blacks who live in neighborhoods of less than 25, 25-49, and 50-74 percent black using the Index of Dissimilarity. It was found that in order for blacks living in black neighborhoods to have the same percentage distribution in each of the nine major sub-regions as blacks living in neighborhoods of less than 25, 25-49, 50-74 percent black, the percentage of blacks in the former type of neighborhood that would have to be redistributed would be 13, 33, and 17 percent respectively. Clearly, with respect to our sample, the distribution of blacks in neighborhoods with different racial compositions does not differ significantly.

REFERENCES

- Althauser, Robert P., and Michael Wigler. 1972. "Standardization and Component Analysis." Sociological Methods and Research 1(August): 97-135.
- Dickinson, Peter. 1973. "Race and Economic Inequality, 1960-1967." Working Paper No. 73-25. Madison: University of Wisconsin, Center for Demography and Ecology.
- Duncan, Beverly, and Philip M. Hauser. 1960. Housing a Metropolis. Glencoe, Illinois: The Free Press.
- Foley, Donald L. 1973. "Institutional and Contextual Factors Affecting the Housing Choices of Minority Residents." In Segregation in Residential Areas, edited by Amos H. Hawley and Vincent P. Rock, pp. 85-147. Washington, D.C.: National Academy of Sciences.
- Gillingham, Robert F. 1974. "Place to Place Rent Comparisons Using Hedonic Quality Adjustments Techniques." Paper presented at the Conference on the Analysis of Consumer Expenditure Data, Palo Alto, May 2-3, 1974.
- Haugen, Robert A., and A. James Heins. 1969. "A Market Separation Theory of Rent Differentials in Metropolitan Areas." Quarterly Journal of Economics 83(November):660-672.
- Kain, John F., and J.M. Quigley. 1970. "Measuring the Value of Housing Quality." Journal of the American Statistical Association 65(June): 532-549.
- Kain, John F., and John M. Quigley. 1972. "Housing Market Discrimination, Home Ownership, and Savings Behavior." American Economic Review 62(June):263-277.

- King, A. Thomas, and Peter Mieszkowski. 1973. "Racial Discrimination, Segregation, and the Price of Housing." Journal of Political Economy 81(May/June):590-606.
- Kitagawa, E.M. 1955. "Components of a Difference Between Two Rates." Journal of the American Statistical Association 50(December):1168-1194.
- Lapham, Victoria. 1971. "Do Blacks Pay More for Housing?" Journal of Political Economy 79(November/December):244-257.
- Lee, Tong Hum. 1968. "Housing and Permanent Income: Tests Based on a Three-Year Study and Re-interview Survey." Review of Economics and Statistics 50(November):480-490.
- Leeuw, Frank de. 1971. "The Demand for Housing: A Review of Cross-section Evidence." Review of Economics and Statistics 53(February):1-10.
- Muth, Richard F. 1969. Cities and Housing. Chicago: University of Chicago Press.
- _____. 1974. "Residential Segregation and Discrimination." In Patterns of Racial Discrimination, edited by George M. von Furstenberg et al., Vol. 1, pp. 108-119. Lexington, Mass.: D.C. Heath.
- Olsen, Edgar O. 1974. "Do the Poor or the Black Pay More for Housing?" In Patterns of Racial Discrimination, edited by George M. von Furstenberg et al., Vol. 1, pp. 205-211. Lexington, Mass: D.C. Heath.
- Pettigrew, Thomas F. 1973. "Attitudes on Race and Housing: A Social-Psychological View." In Segregation in Residential Areas, edited by Amos H. Hawley and Vincent P. Rock, pp. 21-84. Washington, D.C.: National Academy of Sciences.

- Quigley, John M. 1974. "Racial Discrimination and the Housing Consumption of Black Households." In Patterns of Racial Discrimination, edited by George M. von Furstenberg et al., Vol. 1, pp. 121-137. Lexington, Mass: D.C. Heath.
- Ray, Paul Henry. 1973. Residential Location, Consumer Demand and Urban Structure. Ph.D. dissertation, University of Michigan.
- Reid, Margaret C. 1962. Housing and Income. Chicago: University of Chicago Press.
- Rosen, Sherwin. 1974. "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition." Journal of Political Economy 82(January-February):34-55.
- Straszheim, Mahlon R. 1974. "Racial Discrimination in the Urban Housing Market and Its Effects on Black Housing Consumption." In Patterns of Racial Discrimination, edited by George M. von Furstenberg et al., Vol. 1, pp. 139-164. Lexington, Mass.: D.C. Heath.
- United States Bureau of the Census. 1972. Public Use Samples of Basic Records from the 1970 Census: Description and Technical Documentation, Supplement No. 1. Washington, D.C.: Government Printing Office.
- von Furstenberg, George M., Bennett Harrison, and Ann R. Horowitz, editors. 1974. Patterns of Racial Discrimination. Volume 1: Housing. Lexington, Mass.: D.C. Heath.